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PATENT APPLICATION

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 2610

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Bellevue, Washington 98007

August 25, 2000

TO THE ASSISTANT COMMISSIONER FOR PATENTS:

Transmitted herewith for filing under 137 C.F.R. § 1.53(b) by Express Mail is the

- X a. complete
 b. incomplete

patent application of: Hugh H. BIRCH, David A. BEITEL and Dhiren R. FONSECA,

Title: **SYSTEM AND METHOD FOR MATCHING AN OFFER WITH A QUOTE**

- X 1. An application consisting of 43 pages of specification, claims and abstract and 12 sheets of formal drawings is attached.
- X 2. A newly executed Declaration and Power of Attorney is attached.
- X 3. An Assignment of the invention to Microsoft Corporation is attached. A Cover Sheet prepared in accordance with 37 C.F.R. § 3.31 is attached to the Assignment. Please record this Assignment in accordance with 37 C.F.R. § 3.11. The enclosed credit card payment form includes the \$40 Assignment fee.
- X 4. A filing date in accordance with 37 C.F.R. § 1.10 is requested. The Express Mail Certificate appears on the preceding page.
- X 5. The following additional documents are enclosed: Certificate of Express Mail, Petition to Make Special, 11 Patent References, Return Postcard.

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COMPUTATION OF FEE

	Number Filed		Number Extra		Rate		Basic Rate \$690.00
Total Claims	29	=	9	x	\$18/\$9	=	162.00
Independent Claims	3	=	0	x	\$78/\$39	=	0.00
Multiple Dependent Claims	-0-		---		\$260/\$130	=	
TOTAL							\$852.00

 X 6. A Credit Card Payment form authorizing charges in the amount of \$1022.00 to cover the total fee as computed above plus the \$40.00 Assignment fee and the \$130 Petition fee is enclosed.

Please address all further correspondence to:

MICHALIK & WYLIE^{PLLC}

14645 Bel-Red Road

Suite 103

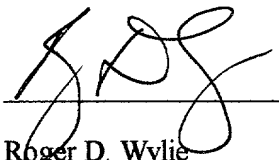
Bellevue, WA 98007

Phone: (425) 653-3520

fax: (425) 653-3603

Respectfully submitted,

MICHALIK & WYLIE^{PLLC}



Roger D. Wylie

Registration No. 36,974

In re Application of BIRCH et al.
Attorney Docket No. 2610

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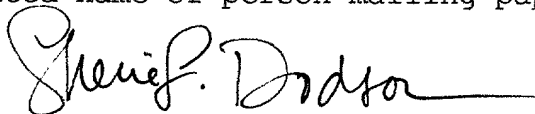
I hereby certify that the following documents:

New Patent Application in the name of Hugh H. BIRCH, David A. BEITEL and Dhiren R. FONSECA for **"System And Method For Matching An Offer With A Quote,"** including 34 Pages Specification, 8 Pages Claims, 1 Page Abstract, 12 Sheets Of Drawings, Transmittal Sheet, Credit Card Payment Form, Petition to Make Special, Eleven References, Executed Declaration and Power of Attorney, Assignment Recordation Cover Sheet and Assignment

are being deposited with the United States Postal Service "Express Mail Post Office To Addressee" Service under 37 C.F.R. 1.10 on the date indicated above and is addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

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SYSTEM AND METHOD FOR MATCHING AN OFFER WITH A QUOTE

FIELD OF THE INVENTION

The present invention relates to electronic commerce. More
5 specifically, the invention relates to the purchase of travel
services, such as airfare, in an electronic exchange transaction.

BACKGROUND OF THE INVENTION

More and more people are purchasing goods and services
electronically, such as over the Internet. Electronic exchange
10 systems are achieving widespread use in the area of travel
arrangements. These systems provide an outlet for suppliers
having surplus inventory, and often allow consumers to obtain
desired goods or services at below-market rates. One such system
15 of electronic exchange is used by "online travel service
exchangers" and allows customers to place an offer for travel
services, such as airfare or airline accommodations. However,
existing online travel service exchangers suffer from various
problems. For instance, existing systems do not allow individual
20 travel service providers to better their chances at being
selected as the winner of the offer. One reason is that existing
online travel service exchangers satisfy a consumer's offer by
simply querying a list of providers to determine whether one or
more are willing to accept the consumer's offer. The first

provider that satisfies the offer is selected and the offer is matched. Travel service providers are not incentivized to offer more-attractive rates that will increase the likelihood that a customer offer will be accepted.

5 In addition, existing schemes charge a purchaser the value of the purchaser's offer even if that value exceeds what the purchaser would have paid without the aid of the electronic travel service system. In other words, even if the purchaser's offer exceeds a published rate for the travel services, existing
10 schemes punish the purchaser by charging her the full value of the offer.

An effective electronic exchange system for matching an offer by a consumer with a quote from a travel service provider has eluded those skilled in the art.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides a system that matches customer's offers for travel services with quotes from providers of those travel services in a way that allows providers
20 to negotiate preferential treatment. The travel service exchanger first assigns providers to one of two provider groups: a preferred provider group and a non-preferred provider group. Within the preferred provider group, each of a plurality of providers is assigned a ranking. The preferred provider status,
25 and the ranking assigned to each preferred provider within the

preferred provider group, may be negotiated between the travel service exchanger and the individual providers. Each ranking may correspond to slightly different criteria with respect to pricing, availability requirements, profit margins, and various other criteria. The non-preferred providers may be grouped together with no particular ranking, but they may also be ranked according to some negotiated agreement or some other criteria.

When a customer offer is received, the travel service exchanger may attempt to satisfy the customer offer from published fares (e.g., "rack rates") for the desired travel services. For example, a customer's offer for airfare between two cities at a certain price may be higher than a rate at which the customer can purchase the airfare without the aid of the electronic exchange process. In that case, the travel service exchanger acts as an electronic travel agent, and satisfies the customer's offer without resorting to the preferred or non-preferred groups and charges the customer the published rate (rather than the full value of the offer). In the more common situation where the customer offer is below the published fares, the travel service exchanger requests rate information from the highest-ranked provider in the preferred provider group for the travel services identified in the customer offer. The highest-ranked provider may return one or more fares. The travel service exchanger compares the fares returned by the highest-ranked provider to the customer offer. If the offer can be satisfied by

the highest-ranked provider, then the offer is matched with the highest rate supplied by the highest-ranked provider and the airfare is booked. If the offer cannot be satisfied by any of the fares supplied by the highest-ranked provider, then the travel service exchanger moves to the next-highest ranked provider and repeats the request. The request is made to each preferred provider, in order of preference, until either the customer offer is satisfied, or the preferred provider group is exhausted, meaning that none of the preferred providers were able to satisfy the customer offer within the constraints of the preferential rankings.

If customer offer is not satisfied by the preferred providers, the travel service exchanger moves to the non-preferred provider group. The travel service exchanger then issues requests to each non-preferred provider for fares on the travel services described in the customer offer. The travel service exchanger then selects a rate from those returned as a match for the customer offer. The travel service exchanger may base the selection of a matching rate on the lowest rate, the least restrictive rate, the highest rate that still affords the travel service exchanger a reasonable profit, a random selection, or any other criteria. It should be noted that the fares supplied by the preferred providers, although not satisfying the constraints of the preferential treatment, may still be used in the non-preferred provider analysis. In addition, when

evaluating whether a rate satisfies the customer offer, the travel service exchanger includes the actual taxes that will be imposed on the purchase transaction to ensure that the customer is not surprised by a charge that exceeds the customer offer because of taxes. Finally, if a satisfactory rate is selected, the travel services are booked with the corresponding service provider.

These and other aspects of the invention, together with the benefits and advantages realized, will become apparent from a reading of the following detailed description in conjunction with the drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram representing a typical computer system into which one implementation of the present invention may be incorporated;

Figure 2 is a functional block diagram generally illustrating one implementation of an online travel service exchanger system constructed in accordance with the present invention;

Figure 3 is a functional block diagram generally illustrating one implementation of an online travel service exchanger of the system illustrated in Figure 2;

Figure 4 illustrates, in tabular format, one example of the type of information that may be stored within a customer database employed in one implementation of the present invention;

Figure 5 illustrates, in tabular format, one example of the type of information that may be stored within an airline database employed in one implementation of the present invention;

Figure 6 illustrates, in tabular format, one example of the type of information that may be stored within an offer history database employed in one implementation of the present invention;

Figures 7-9 are sample screen displays that may be presented to a customer when interfacing with one implementation of the present invention;

Figure 10 is a logical flow diagram generally illustrating a process performed by one implementation of the present invention to match an offer from a customer with a quote from one or more providers;

Figure 11 is a logical flow diagram generally illustrating the functions performed by one implementation of the present invention to receive customer offer information;

Figure 12 is a logical flow diagram that generally illustrates a process performed by one implementation of the present invention to attempt to book airfare with one of a group of preferred airlines;

Figure 13 is a logical flow diagram that generally illustrates a process performed by one implementation of the

present invention to attempt to book airfare with one of a group of non-preferred airlines;

Figure 14 is a logical flow diagram generally illustrating a process performed by one implementation of the present invention to book accommodations with a airline having been identified as a winner by one implementation of the present invention.

DETAILED DESCRIPTION

One illustrative system constructed in accordance with the present invention may be implemented as an electronic travel services broker. The several components of the illustrative system are described first, followed by a description of the operation of the system through the interaction of the several components. The illustrative system described is but one of many alternative electronic exchange purchase transactions that can be implemented in accordance with the present invention, and the breadth and scope of the invention is not limited to the particular embodiments described here.

Exemplary Computing Device

Figure 1 is a functional block diagram generally illustrating a computing device 100, one or more of which may be adapted for use in the illustrative system for implementing the invention. The computing device may be, for example, a personal computer, a handheld device such as a cell phone or a personal

digital assistant, multi-processor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

In its most basic configuration, computing device 100 typically includes at least one processing unit 102 and system memory 104. Depending on the exact configuration and type of computing device, system memory 104 may be volatile (such as RAM), non-volatile (such as ROM, flash memory, etc.) or some combination of the two. The basic configuration of the device 100 is illustrated in Figure 1 within dashed line 106.

Device 100 may also have additional features and functionality. For example, device 100 may also include additional storage (removable and/or non-removable) including, but not limited to, magnetic or optical disks or tape. Such additional storage is illustrated in Figure 1 by removable storage 108 and non-removable storage 110. Computer storage media includes volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer readable instructions, data structures, program modules, or other data. System memory

104, removable storage 108, and non-removable storage 110 are
examples of computer storage media. Computer storage media
includes, but is not limited to, RAM, ROM, EEPROM, flash memory
or other memory technology, CD-ROM, digital versatile disks (DVD)
5 or other optical storage, magnetic cassettes, magnetic tape,
magnetic disk storage or other magnetic storage devices, or any
other medium which can be used to store information and which can
be accessed by device 100. Any such computer storage media may
be part of device 100.

10 Device 100 includes one or more input devices 112 such as a
keyboard, mouse, pen, puck, voice input device, touch input
device, scanner, or the like. One or more output devices 114 may
also be included, such as a video display, audio speakers, a
printer, or the like. Input and output devices are well known in
15 the art and need not be discussed at length here.

Device 100 also contains communications connection 116 that
allows the device 100 to communicate with other devices 118, such
as over a local or wide area network. Communications connection
116 is one example of communication media. Communication media
20 includes any information delivery media that serves as a vehicle
through which computer readable instructions, data structures,
program modules, or other data may be delivered on a modulated
data signal, such as a carrier wave or other transport mechanism.
The term "modulated data signal" means a signal that has one or
25 more of its characteristics set or changed in such a manner as to

encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, electromagnetic (e.g., radio frequency), infrared, and other wireless media. The term computer readable media as used herein includes both storage media and communication media.

Illustrative Electronic Travel Agent System

Figure 2 is a functional block diagram generally illustrating one implementation of an electronic travel service exchanger system (the system 200) constructed in accordance with the present invention. The system 200 is constructed to aid a customer to purchase a product, such as travel goods or services, in an electronic exchange transaction. The system 200 may be implemented as software modules or components stored and executing on one or more computing devices, such as that illustrated in Figure 1. The system illustrated in Figure 2 and described here is but one of the many implementations that will become apparent by the teachings of the present invention.

The system 200 includes a customer machine 201, an online Travel service exchanger (OTSE) 202, an availability determination component 203 (e.g., a Global Distribution System), and a network 204 of travel service providers, such as airlines that have agreed to participate in the system 200. Although well suited for use in conjunction with an airline network 204, this

implementation of the invention has equal applicability to other provider networks and the airline network 204 is offered only as one example. As described below, each of these components may include one or more computing devices, such as the computing device 100 described above. Moreover, each of the components may be interconnected over a wide area network, such as the Internet 206. Although the following discussion will make reference to the Internet 206 as a specific wide area network, those skilled in the art will appreciate that any mechanism for connecting multiple computing devices may equally be used.

The customer machine 201 is a computing device connected to the Internet 206 over a network connection 208, such as a dial-up modem connection, a coaxial cable connection, a digital subscriber line connection, or the like. The customer machine 201 may be adapted to interact with other computing devices over the Internet 206 through the use of browsing software 205. The browsing software 205 may be integrated into an operating system executing on the customer machine 201. Via the browsing software 205, a customer of the customer machine 201 may retrieve Web pages or other documents from other computing devices attached to the Internet 206, and may additionally provide information to those other computing devices.

The Global Distribution System (GDS) 203 is a central repository of fare and availability information for the airlines in the airline network 204. The GDS 203 may interface with other

computing devices connected to the Internet 206 via network connection 214. If it is connected to the Internet 206, the GDS 203 may include information server software 216 for managing transactions with other computing devices over the Internet 206.

5 The GDS 203 may include and maintain a data store 218 that contains the fare information associated with each airline in the airline network 204. As will be appreciated by those in the art, the GDS 203 may store fare information for both public fares (e.g., those made available to the general public), and private
10 fares (e.g., special fares negotiated between individual airlines and brokers, such as the OTSE 202).

15 The GDS 203 is adapted to place queries to each airline in the airline network 204 and receive current fare information from those airlines, and to store that information in the data store 218. The GDS 203 may make that information available to entities interested in booking travel arrangements, such as the OTSE 202. Moreover, the GDS 203 is adapted to make reservations with
20 airlines in the airline network 204 upon request by those entities. The use of a global distribution system, such as the GDS 203, to transact with airlines is generally known in the art. It should be appreciated that each airline in the airline network 204 may be connected to and interface with the GDS 203 in a conventional manner to upload fares and download booking and ticketing information. Examples of such global distribution

systems in common use today are Worldspan, SABRE, Galileo, and Amadeus.

One or more airlines in the airline network 204 may be connected to the Global Distribution System (GDS) 203 over the Internet 206, via network connection 210. Alternatively, one or more airlines may be directly connected to the GDS 203, such as through a dedicated network connection 212. In addition, one or more airlines may directly connect to the OTSE 202 via a dedicated network connection 213.

The airline network 204 includes two groups of airlines: a preferred airlines group 207 and a non-preferred airlines group 209. Each of the preferred airlines 207 is assigned a distinct preference. As will be discussed in detail later, the preferences provide a mechanism by which an airline may increase its likelihood of being selected as a match for the customer's offer. More particularly, the preferences are used by the OTSE 202 to determine the order in which quotes are requested from the airlines in the airline network 204. The preference may be negotiated between the particular preferred airlines 207 and the entity responsible for maintaining the OTSE 202. For example, in order to better its chances of being selected as a match for the customer's offer, an airline may agree to guarantee an acceptable profit margin to the OTSE 202. The preference assigned to each preferred airline may reflect the amount of guaranteed profit

margin negotiated by each preferred airline (e.g., those airlines guaranteeing lower profit margins are granted lower preferences).

As another example, preferences may be assigned according to particular airlines' market share. That is, airlines are chosen based upon a round robin scheme where an airline having X percent of market share is given most-preferred status X percent of the time. Alternatively, the market share of the airline may be factored into a scheme for deciding preference. In another example, an airline may be given regional or geographical preferencing. Many alternatives are contemplated, including but not limited to providing preferred airlines alphabetically, contractually, or randomly.

The non-preferred airlines group 209 constitutes those airlines that provide the OTSE 202 with private fares (e.g., fares below the public published fares) but choose not to negotiate preferential treatment. In other words, the non-preferred airlines 209 accept a lower chance of being selected in exchange for not providing fare guarantees to the OTSE 202.

The OTSE 202 includes one or more computing devices, such as that illustrated in Figure 1, and is connected to the Internet 206 through a network connection 220. The OTSE 202 optionally may be connected to the GDS 203 through a dedicated network connection 221. The OTSE 202 is illustrated in greater detail in Figure 3 and described below. Generally described, the OTSE 202 includes a Web server component 222, a travel server component

224, and a data store 228. Although illustrated in three components, those skilled in the art will appreciate that the functions of each described component may be merged into fewer components, or similarly, distributed among more components. The use of three illustrative components is for simplicity of discussion only, and should not be viewed as an exclusive list of possible components.

Briefly described, the OTSE 202 interfaces with the customer machine 201 and the GDS 203 to administer an electronic exchange purchase transaction. As described in greater detail below, the OTSE 202 receives an offer from the customer machine 201, via the Internet 206, for travel services, such as an airline ticket. The OTSE 202 attempts to satisfy the customer's offer by retrieving from the GDS 203 one or more quotes for the identified travel services. Rather than merely requesting quotes from randomly selected airlines, the OTSE 202 first requests quotes from one preferred airline at a time in descending order of preference until the offer is satisfied. If no preferred airline satisfies the offer, the OTSE 202 may request quotes from a group of non-preferred airlines in the airline network 204. The OTSE 202 then satisfies, if possible, the offer with one of the quotes from the non-preferred airlines.

Figure 3 is a functional block diagram generally illustrating one implementation of the OTSE 202. As mentioned above, the OTSE 202 includes a Web server component 222, a travel

server component 224, and a data store 228. The data store 228 of the described embodiment contains various types of information used by the different components of the OTSE 202. For instance, the data store 228 includes a customer database 305 that is used to store information related to customers that use the OTSE 202 to book travel arrangements. Figure 4 illustrates, in tabular format, one example of the type of information that may be stored within the customer database 305. Referring briefly to Figure 4, a table 401 includes a record for each customer of the OTSE 202. Each record may include a customer identifier 403, authentication information 405 for the customer (such as a password), an email address 407 for the customer, and other information 409 associated with the particular customer.

The data store 228 also includes an airline database 307 that contains information about each airline in the airline network 204. In particular, the airline database 307 may identify each of the airlines in the airline network 204 and identify whether they are preferred airlines 207 or non-preferred airlines 209. Further, the airline database 307 may include the particular preferences associated with each of the preferred airlines 207.

The airline database 307 is used by the travel server 224 to identify the airlines from which to request a quote in response to an offer from the customer machine 201. Figure 5 illustrates, in tabular format, one example of the information that may be

stored within the airline database 307. Referring briefly to Figure 5, a table 501 includes a record for each airline in the airline network 204. Each record includes an airline identifier (e.g., a carrier code) 503 that uniquely identifies each airline in the airline network 204. The record also identifies, in the preferred column 505, whether the corresponding airline is a member of the preferred airlines group 207 or the non-preferred airlines group 209. If the corresponding airline is a preferred airline, the record includes, in the preference column 507, the particular preference associated with the corresponding airline. For example, if there are five preferred airlines in the preferred airlines group 207, the preference column 507 may include a number from one to five, a letter from A to E, or any other indicator of the relative preferences of the preferred airlines 207. Moreover, for those airlines designated as preferred, the airline database 501 may include a preferred criteria column 508 that includes criteria for determining whether the preferred airline matches the offer. For example, if a particular criterion, such as an acceptable profit margin to the OTSE 202, had been negotiated by the most preferred airline, that criteria may be stored in the preferred criteria column 508 corresponding to the most preferred airline. In that way, the OTSE 202 may evaluate whether an offer provided by a preferred airline satisfies the criteria. Other information 513 associated

with the corresponding airline may also be included in the other information column 509.

Returning to Figure 3, the data store 228 also includes an offer history database 309, which contains the storage information related to offers provided to the OTSE 202 by various customers. As described in greater detail below, the offer history database 309 may be used by the travel server 224 to prevent customers from recursively submitting offers on the same travel services in an attempt to identify the lowest possible price point at which an offer may be matched. Figure 6 illustrates, in tabular format, one example of the information that may be stored within the offer history database 309.

Referring to Figure 6, a table 601 includes a record for each offer provided to the OTSE 202. Each record includes an offer identifier 603 to uniquely identify the offer, and a customer identifier 605 of the customer that provided the offer. The customer identifier 605 may be the customer identifier 403 (Figure 4) or some other mechanism to uniquely identify the customer, such as an e-mail address, IP address, or the like.

The table 601 also includes a column of information used to purge stale records from the offer history database 309. In the described example, a record for an offer is purged from the offer history database 309 after a predetermined amount of time (e.g., 24 hours) has elapsed since the offer. Toward that end, a time column 607 may reflect the time when the corresponding offer was

made. Other offer information 609 may also be included in the offer history database 309.

Returning once again to Figure 3, other files 311 may also be contained within the data store 228. For instance, HTML and XML files served by the Web server 222 may be contained within the data store 228 for use in constructing user interface screens as will be described later. Other information may also be stored on the data store 228.

The Web server component 222 of the OTSE 202 controls the interface between the OTSE 202 and the customer machine 201. The Web server 222 includes a user interface component 303 configured to assemble and serve Web pages over the Internet 206 to various computing devices, such as the customer machine 201. The user interface 303 may also receive information provided by interacting with those Web pages. Thus, the user interface 303 may make information received from the customer machine 201 available to the Web server 222, which may in turn make that information available to other components of the OTSE 202, such as the travel server 224.

The travel server 224 is configured to access the airline database 307 when an offer is provided to it by the Web server 222. Based on the parameters provided with the offer, the travel server 224 accesses the airline database 307 to identify potential airlines within the airline network 204 that may satisfy the offer. It should be noted that the travel server 224

need not contact the airlines directly or the GDS 203 to identify airlines that may potentially satisfy the offer. Rather, sufficient information about the participating airlines in the airline network 204 is stored locally within the airline database 307. The travel server 224 is also configured to interface with the GDS 203 to query for fares and availability provided by the airlines selected from the airline database 307. The travel server 224 may also be configured to make airline reservations with the GDS 203.

Illustrative User interface Screens

Figures 7-9 are sample screen displays that may be presented to a customer of the customer machine 201 when interfacing with the OTSE 202. Each of the sample screen displays represents one or more HTML or XML pages assembled and served by the user interface component 303 of the Web server 222, as interpreted and rendered by the Web browsing software 205 of the customer machine 201. The sample screen displays may be used by the system 200 to provide information to and receive information from the customer machine 201. The sample screen displays are provided as examples only, and the particular layout of the sample screen displays are not critical to a proper functioning of the invention.

Figure 7 is a graphical representation of an initial screen display 701 presented to a customer to begin the offer process.

In this screen display 701, the customer is prompted with a departure field 702 so that the customer may identify from what city or airport the customer wishes to begin the travel. The customer is also prompted with a destination field 703 so the customer can identify the destination of the travel, such as a particular city or airport. In this implementation, the departure field 702 and the destination field 703 are configured to receive alphanumeric indicators of either the names of the respective cities or airport codes that are commonly used to identify particular airports around the world.

The customer is also prompted with a departure field 705 and a returning field 707 which together allow the customer to define the desired travel dates. Additionally, the customer may be prompted with travelers fields 709 to identify the number of travelers that fall into certain age groups. The customer may be prompted with a connections field 711 to identify a maximum number of stops that the customer is willing to make while traveling. And finally, in this screen display 701, the customer is prompted for an offer value 713 that identifies the maximum amount that the customer is willing to pay (per traveler) for the airfare. It should be noted that the amount entered in the offer value field 713 will be the total amount charged to the customer upon a successful quote selection, as opposed to the prior practice of adding taxes and the like to the offer value before charging the customer. Optionally, the initial screen display

701 (or any other screen display) may provide the customer with an option of identifying particular airlines that the customer deems to be undesirable, and which should be avoided during the electronic exchange match selection. By activating the next
5 button 715, the customer causes the information provided in the several fields on the initial screen display 701 to be posted to the Web server 222, where it is stored in the data store 228. Activating the next button 709 may also cause the user interface component 303 to transmit to the customer machine 201 a traveler identification screen display.

Figure 8 is a graphical representation of a traveler identification screen display 801. In this embodiment, the traveler identification screen display 801 prompts the customer to provide personal information about the travelers identified in the previous screen. In particular, the customer may be prompted to provide a last name 803, a first name 805, and phone numbers 807 for each identified traveler. A special assistance field 809 may be provided to allow the customer to identify whether the traveler is in need of special assistance while traveling. In
20 addition the customer may be prompted to provide contact information 811 in case of an emergency.

The OTSE 202 may require the customer to create an account prior to continuing with the offer matching process. For instance, the traveler identification screen display 801 may
25 include fields, such as a member ID field 813 and a password

field 815, that allow the customer to either create a new account or login to an existing account. A check box 817 may allow the customer to have the password 815 stored on the customer machine 201 to avoid having to retype the password later. Moreover, an e-mail field 819 may prompt the customer for an e-mail address associated with the account and to which confirmation may be transmitted. By activating the next button 821, the customer causes the information provided in the several fields on the traveler identification screen display 801 to be posted to the Web server 222, where the information is stored in appropriate locations, such as the customer database 305, or used to verify the customer's account. Activating the next button 821 may also cause the user interface component 303 to transmit to the customer machine 201 a verification screen display.

Figure 9 is a graphical representation of a verification screen display 901. The verification screen display 901 may be generated by the user interface component 303 of the Web server 222 based on information provided through the other screen displays. For example, the Web server 222 (Figure 3) may retrieve from the data store 228 the information provided on the initial screen display 701 and summarize that information in a summary field 903. The summary field 903 may provide the offer amount, the city pair, and the dates of travel for verification by the customer.

The verification screen display 901 may additionally prompt the customer for credit card information, such as a credit card type 905, credit card number 907, and expiration date 909. A check box field 911 may be provided to allow the customer to have the credit card information stored for future use, such as on the data store 228 or locally on the customer machine 201. A billing address field 911 may be used for credit card validation, and a delivery address field 913 may be used to identify where to deliver the tickets if purchased. Again, by activating the next button 915, the customer causes the information provided in the several fields on the verification screen display 901 to be posted to the Web server 222, where the information is stored and may possibly be verified. Activating the next button 999 may also cause the user interface component 303 to transfer control to the travel server 224 to proceed with the current offer transaction.

In summary, the preceding discussion has been directed to describing the configurations and functions of each of the several components, data structures, and subsystems of the online travel service exchanger system generally depicted in Figure 2. The following discussion is presented as a detailed description of the interactions of the described components, data structures, and subsystems through processes performed in accordance with implementations of the invention.

Operation of an Exemplary Electronic Exchange Matching System

Figures 10-15 are logical flow diagrams that generally illustrate several processes performed by the illustrative online travel service exchanger system illustrated in Figures 2-9 and described above. The general and specific operation of the system 200 is illustrated through the several flow diagrams described below, with reference to the components of the system described above and illustrated in Figures 2-9. For ease of description, the flow diagrams disclose one embodiment of the operation of the present invention. However, it can be understood that different processes and/or different chronological orders may be implemented within the spirit of the present invention.

Figure 10 is a logical flow diagram generally illustrating a process performed by the system 200 to match an offer from a customer with a quote from one or more travel service providers. The process begins at step 1003, where the system 200 receives customer offer information. The operations performed at step 1003 are illustrated in detail in Figure 11 and described below. Briefly described, the customer provides sufficient information for the system 200 to initiate the offer matching process. For example, in the described embodiment, the customer identifies at least an offer price and a description of the travel services, such as a travel city pair and dates of travel. In addition, the system 200 may request payment (e.g., credit card) information

from the customer prior to proceeding with the offer process. Once the information is received, the process continues to step 1005.

At step 1005, the system 200 attempts to book the travel services with the preferred airlines. Briefly described, the system 200 attempts to book the requested travel services with each preferred airline, beginning with the most preferred, until either there are no more preferred airlines or until an acceptable fare is found. As can be understood, when the system 200 attempts to book the travel services, the quotes supplied by the providers are not shown to the user. The operations performed at step 1005 are illustrated in detail in Figure 12 and described below. If none of the preferred airlines provide an adequate quote that satisfies the customer's offer, then, from decision step 1007 the process continues to step 1009.

At step 1009, the system 200 attempts to book the travel services with one of the non-preferred airlines. In an alternate embodiment, the system may also at this time try to book travel services with a preferred airline that does not meet the preferred criteria. That is, the fares from a preferred airline that were not acceptable for booking in step 1005 may be considered in step 1009 in the same consideration process given to the non-preferred airlines. In any event, the operations performed at step 1009 are illustrated in detail in Figure 13 and described below. Briefly described, the system 200 issues

requests to one or more of the non-preferred airlines (or preferred airlines fares that do not meet the preferred criteria as described above) for fares that correspond with the offer information (e.g., the travel city pair and travel dates). The system 200 then selects the lowest of the returned fares that satisfies the customer's offer. If none of fares satisfy the customer's offer, then, from decision step 1011 the process returns a failure indicating that the customer's offer was not accepted. If, however, an acceptable fare is returned, the system 200 selects that fare as the winning fare. If more than one acceptable fare is returned, the system 200 may select the lowest of the acceptable fares. At step 1013, the winning fare is booked with the corresponding airline. The operations performed at step 1013 to book the fare are illustrated in detail in Figure 14 and described below.

It should be noted that, unlike previous systems where the customer may be charged taxes in addition to the offer amount, with the current system an estimate is made of any taxes that may be applicable to the particular travel services requested. The estimated taxes are then added to the evaluated fares to ensure that the amount charged to the customer's credit card does not exceed the offer amount. Once the customer has been charged, and appropriate notifications given, the process illustrated in Figure 10 terminates.

Figure 11 is a logical flow diagram generally illustrating the operations performed at step 1003 of the process illustrated in Figure 10 to receive customer offer information. The process of Figure 11 begins at step 1103, where the customer is prompted for information about the customer's travel plans, in particular the travel destination (e.g., a city) and the dates of travel. For example, the customer may be presented with the initial screen display 701 illustrated in Figure 7 and described above.

At step 1105 the customer is prompted to identify the individuals for whom the travel services are being offer. Toward that end, the OTSE 202 may present to the customer the traveler identification screen display 801 illustrated in Figure 8 and described above. The customer may be prompted to provide names and ages for each individual traveling. In addition, the customer may be required by the OTSE 202 to create or login to an account.

At step 1109, the customer is prompted to verify that the information thus far provided is accurate, and to confirm the offer transaction. For instance, the OTSE 202 may present the customer with the verification screen display illustrated in Figure 9 and described above. As part of the verification, the customer may be prompted to provide payment information, such as a credit card number, prior to proceeding. If the customer indicates that the offer information is incorrect, then, from decision step 1113, the process returns to step 1103 where the

customer is prompted to provide the offer information again. If the customer verifies the offer information, the process proceeds to step 1117 where the payment information is stored, and the process returns to Figure 10. Alternatively, if an error occurs (e.g., failure of the credit card number) during the verification process, an error handling procedure may be implemented.

Figure 12 is a logical flow diagram generally illustrating a process performed to attempt to match the customer's offer with one of the preferred airlines. The process begins at step 1203, where the OTSE 202 identifies the most preferred airline from the group of preferred airlines 207. To make that identification, the travel server 224 may query the records within the airline database 307. Once the most preferred airline is identified, the process proceeds to step 1205.

At step 1205, a request is sent to the GDS 203 for fares associated with the most preferred airline. The request includes the carrier code associated with the most preferred airline and the offer information, including the city pair and the travel dates. The request may additionally include a rate code that indicates that special pricing is being requested on behalf of the OTSE 202. When the GDS 203 returns the fares, the process continues at step 1207.

At step 1207, the OTSE 202 evaluates the fares returned to determine whether one or more of the fares satisfies the offer. It should be noted that the airline may return many, even dozens,

of possible fares associated with the offer information. In that case, the system 200 selects the highest fare provided that still satisfies the preferred criteria 508 for the particular airline (stored in the airline database 307) and returns success to the process illustrated in Figure 10 and described above. However, if none of the fares returned by the most preferred airline satisfies the preferred criteria 508, the process continues to decision step 1211.

As is described above, the preferred criteria is optional, and may only be needed in a situation in which the preferred airline has negotiated preferred status based upon an amount of the price that the airline is willing to forego in order to procure preferred status. If other methods are used to procure preferred status (e.g., market share or geographical preferences as described above), then an offer may be satisfied by comparing the price of the airfares provided by the preferred airline against the offer, with any adjustments needed for desired profit for the OTSE 202.

In any event, at decision step 1211, a determination is made whether there remain more preferred airlines that have not yet been requested to satisfy the customer's offer. If there are no more, then the process returns a failure to decision step 1007 of the flow diagram illustrated in Figure 10. Otherwise, at step 1215, the travel server 224 takes the next-most preferred airline and returns to step 1205, where fares are requested from that

airline. The process illustrated in Figure 12 continues until either an acceptable fare is provided, or until the group of preferred airlines is exhausted.

Figure 13 is a logical flow diagram generally illustrating a process performed to attempt to book travel services that satisfy the customer's offer with a non-preferred airline. The process begins at step 1303, where a request for fares is issued to the GDS 203 for each non-preferred airline. Those skilled in the art will appreciate that each request may be issued by the travel server 224 to the GDS 203 in the form of a message including the airline identifier (carrier code) 503 and a rate plan code. The airline identifier 503 identifies the particular airline from which availability and fares are requested, while the rate plan code indicates to the GDS 203 that specially negotiated fares are being requested. The request additionally includes other offer information such as the dates of travel and city pair. A separate request may be issued for each non-preferred airline.

At step 1305, the travel server 224 may select from those fares returned by the several non-preferred airlines a lowest fare that satisfies the customer's offer. In other words, if the customer's offer could not be satisfied by the preferred airlines in accordance with the preferred criteria associated with the particular preferred airline, then the lowest returned fare may be selected from the non-preferred airlines. As noted above, fares supplied by the preferred providers, although not

satisfying the constraints of the preferential treatment, may still be used in the non-preferred provider analysis. In that case, the fares provided by the preferred airlines are evaluated against the non-preferred airlines without regard to the preferred criteria. If an acceptable fare is identified, the process returns success to step 1009 of the flow diagram illustrated in Figure 10. Otherwise, if an acceptable fare is not identified, the process returns failure to step 1009 of the flow diagram illustrated in Figure 10.

Figure 14 is a logical flow diagram generally illustrating a process performed by the travel server 224 to book the selected fare. At decision step 1403, a determination is made whether the selected fare is higher than the winning airline's published fare for the travel services. Decision step 1403 is essentially a customer-protection reality check to ensure that customers are not charged for airfare through the system 200 in excess of what would be charged having gone through conventional travel arrangements. If the selected fare is above the published fare, then, at step 1405, the published fare is selected for booking and the process continues to step 1407. Otherwise, the currently selected fare remains the selected fare and the process continues to step 1407.

At step 1407, the travel server 224 attempts to book the airfare with the GDS 203 at the selected fare. If, at decision step 1409, the travel server 224 is successful at booking the

accommodations at the selected fare, the process continues to step 1417, where the customer is charged for the airfare. It should be noted that the customer is either charged the offer value, or the published fare, depending on which is lower. The process then returns success to step 1013 illustrated in Figure 10. However, if the travel server 224 fails to successfully book the accommodations (e.g., an airline providing a fare quote may respond that it no longer has availability at that fare), the process continues to step 1410.

At step 1410, the travel server checks to see if the preferred airline has other fares that are available. If so, then step 1410 loops back to step 1407, where the travel server attempts to book the other airfare. If there are not any other fares available from the preferred airline, then step 1410 branches to step 1411, where the winning airline is eliminated as a possible match for the offer. Then, at step 1413, the process returns to step 1005 of Figure 10, where the process repeats to select another acceptable airline.

If desired, a time-out mechanism may be utilized to prevent a search for an individual from utilizing too many server resources. For example, the travel server may define a ten-minute limit for a search. The time-out may be treated as a failed search or may be handled in another manner as appropriate.

Although the system chosen to describe the present invention is an online travel service exchanger system, those skilled in

the art will appreciate that many other types of electronic exchanges may benefit equally from the present invention.

Moreover, the described implementations of the invention are susceptible to various modifications and alternative

5 constructions. It should be understood, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention.

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What is Claimed is:

1. A computer-implemented method of matching an offer for a product with a quote, comprising:

receiving the offer from a customer machine;

5 obtaining at least one quote for the product from a first preferred provider in a group of preferred providers;

evaluating the at least one quote from the first preferred provider to determine if the at least one quote satisfies the offer;

10 if the at least one quote from the first preferred provider does not satisfy offer, repeating the obtaining of the quote and the evaluating of the quote for each preferred provider in the group of preferred providers until the offer is satisfied or until the group of preferred providers is exhausted;

15 if the group of preferred providers is exhausted without satisfying the offer, attempting to satisfy the offer from a group of non-preferred providers; and

20 if the offer is satisfied from either the group of preferred providers or the group of non-preferred providers, negotiating the purchase of the product from the provider associated with the satisfying quote.

25 2. The computer-implemented method of claim 1, wherein attempting to satisfy the offer from the group of non-preferred providers comprises:

obtaining at least one quote from one or more non-preferred providers in the group of non-preferred providers;

evaluating the at least one quote obtained from each non-preferred provider to determine a most competitive non-preferred
5 quote; and

if the most competitive non-preferred quote can satisfy the offer, selecting the most competitive non-preferred quote as the satisfying quote.

10 3. The computer-implemented method of claim 2, wherein the most competitive non-preferred quote includes the lowest quote provided by a non-preferred provider.

15 4. The computer-implemented method of claim 1, wherein the product is a travel service.

5. The computer-implemented method of claim 4, wherein the travel service includes airfare.

20 6. The computer-implemented method of claim 1, wherein evaluating the at least one quote from the preferred providers comprises evaluating the quotes provided by the preferred providers in descending order of value, from the highest quote to the lowest quote, and selecting the highest quote that satisfies
25 the offer.

7. The computer-implemented method of claim 1, wherein negotiating the purchase of the product from the supplier includes making a reservation for a travel service provided by the provider at a value corresponding to the satisfying quote.

8. The computer-implemented method of claim 1, wherein each quote is obtained from each preferred provider and non-preferred provider indirectly through a global distribution system that stores fare information associated with each preferred provider and non-preferred provider.

9. The computer-implemented method of claim 1, wherein each preferred provider includes a respective associated preferred criteria, and wherein evaluating the at least one quote from the first preferred provider to determine if the at least one quote satisfies the offer comprises determining if the quote satisfies the preferred criteria associated with the first preferred provider.

10. The computer-implemented method of claim 9, wherein attempting to satisfy the offer from the group of non-preferred providers comprises evaluating offers from the preferred providers that do not meet the preferred criteria.

11. A computer-readable medium having computer-executable instructions for performing the method recited in Claim 1.

12. A computer-readable medium having computer-executable instructions, comprising:

receiving from a customer machine an offer representing a value that the customer is willing to exchange for a product;

ranking each preferred provider in a plurality of preferred providers according to a preferred criteria;

selecting a highest ranked preferred provider from the plurality of preferred providers; and

attempting to match the offer from the customer with the highest ranked preferred provider by determining whether a quote obtained from the highest ranked preferred provider satisfies the preferred criteria associated with the highest ranked preferred provider.

13. The computer-readable medium of claim 12, further comprising:

if the attempt to match the offer with the highest ranked preferred provider is successful, negotiating a purchase of the product from the highest ranked preferred provider.

14. The computer-readable medium of claim 13, further comprising:

if the attempt to match the offer with the highest ranked preferred provider is unsuccessful, repeatedly attempting to match the offer with other preferred providers until either the offer is matched or until the plurality of preferred providers is exhausted.

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15. The computer-readable medium of claim 14, wherein attempting to match the offer with other providers is performed in descending order of the ranking associated with each preferred provider.

16. The computer-readable medium of claim 14, wherein if repeatedly attempting to match the offer with other preferred providers is unsuccessful, attempting to match the offer with one of a plurality of non-preferred providers, and, if successful, negotiating a purchase of the product from the matching non-preferred provider.

17. The computer-readable medium of claim 16, wherein attempting to match the offer with one of the plurality of non-preferred providers comprises obtaining from one or more non-preferred providers a quote to provide the product, and selecting a lowest quote from the quotes provided that satisfies the offer.

18. The computer-readable medium of claim 16 wherein each quote is obtained from each non-preferred provider indirectly through a global distribution system that stores fare information associated with each non-preferred provider.

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19. The computer-readable medium of claim 12, wherein the product includes a travel service.

20. The computer-readable medium of claim 19, wherein the travel service comprises airfare.

21. The computer-readable medium of claim 12 wherein each quote is obtained from each preferred provider indirectly through a global distribution system that stores fare information associated with each preferred provider.

22. The computer-readable medium of claim 12 wherein the preferred criteria is negotiated with the preferred providers.

20 23. The computer-readable medium of claim 12 wherein the preferred criteria comprises a round robin decision process based upon industry market share of the preferred providers.

24. A computer system for matching offers with quotes,
comprising:

an online travel service exchanger, including:

a web server component configured to interface with a
5 customer machine over a network connection and receive from the
customer machine an offer for a product, the offer identifying a
cost for the product;

a travel server component configured to obtain at least
one quote associated with each provider in a plurality of
10 providers to provide the product at a cost, the plurality of
providers comprising at least two groups: a preferred providers
group and a non-preferred providers group, each preferred
provider having a distinct preference ranking; and

the online travel service exchanger being further configured
15 to attempt to match the offer with each preferred provider in the
preferred providers group in descending order of preference.

25. The computer system of claim 24, wherein the online travel
service exchanger is further configured to negotiate a purchase
20 of the product from the provider selected as a match for the
offer.

26. The computer system of claim 24, wherein the travel server
component obtains the at least one quote associated with each
25 preferred provider from a global distribution system configured

to make available fare information associated with each preferred provider.

27. The computer system of claim 24, wherein the online travel
5 service exchanger is further configured to evaluate quotes
provided by each preferred provider in descending order of
preference ranking by determining whether the quotes provided
satisfy a preferred criteria associated with each preferred
provider.

10 28. The computer system of claim 24, wherein the online travel
service exchanger is further configured to attempt to match the
offer with one of the non-preferred providers by evaluating
quotes supplied by the non-preferred providers to identify a
15 lowest quote and selecting the lowest quote as the matching
quote.

20 29. The computer system of claim 28, wherein the travel server
component obtains the at least one quote associated with each
non-preferred provider from a global distribution system
configured to make available fare information associated with
each non-preferred provider.

Abstract of the Disclosure

Described is a system and method for matching a customer's offer for travel services with quotes from providers of those travel services in a way that allows the providers to negotiate preferential treatment. An online travel service exchanger receives an offer from a customer for travel services, such as airfare. The online travel service exchanger attempts to satisfy the customer's offer by retrieving from a global distribution system one or more quotes for the identified travel services. Rather than merely requesting quotes from randomly selected airlines, the online travel service exchanger first requests quotes from one preferred airline at a time in descending order of preference until the offer is satisfied. If no preferred airline satisfies the offer, the online travel service exchanger may request quotes from a group of non-preferred airlines. The online travel service exchanger then satisfies, if possible, the offer with one of the quotes from the non-preferred airlines.

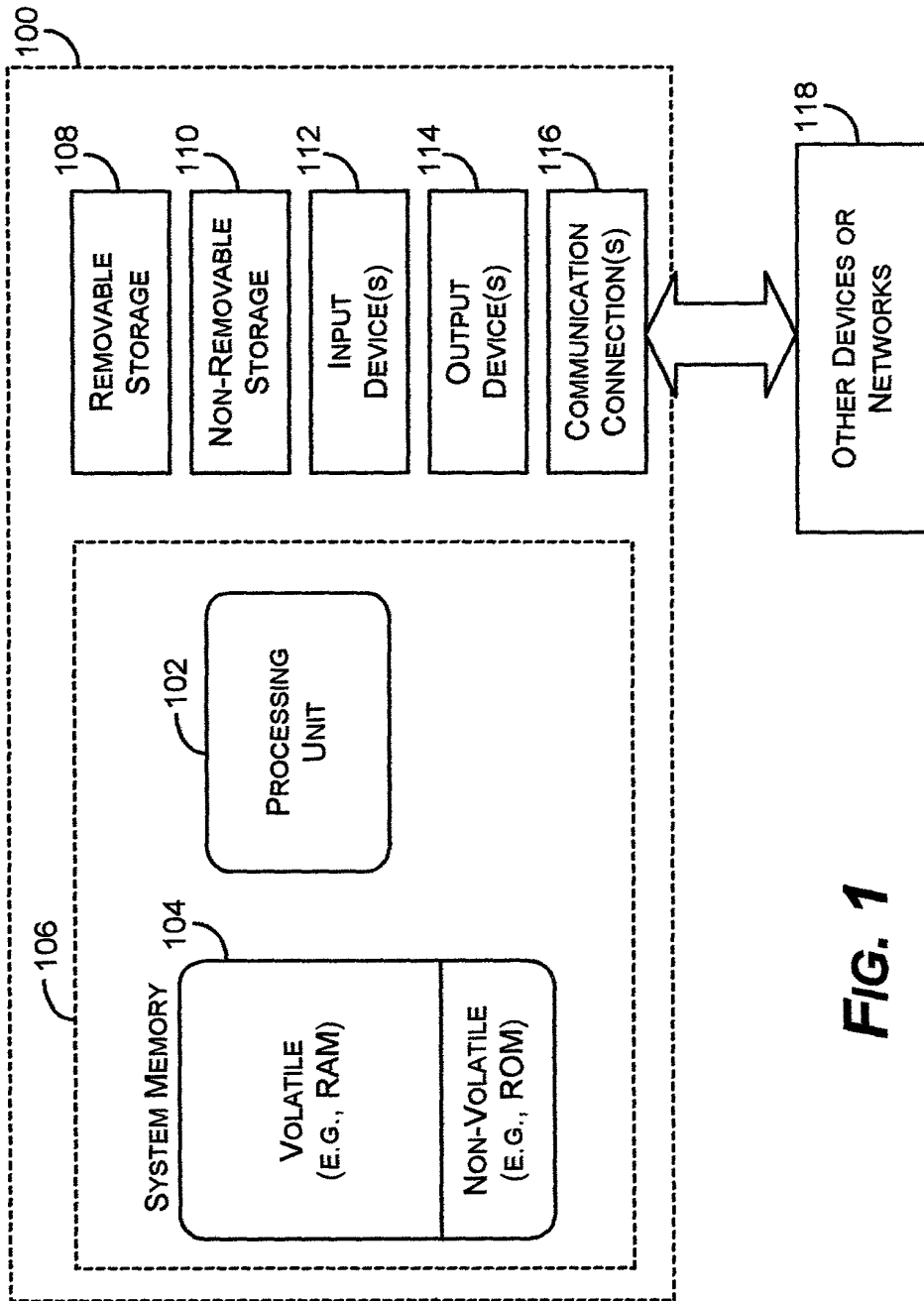
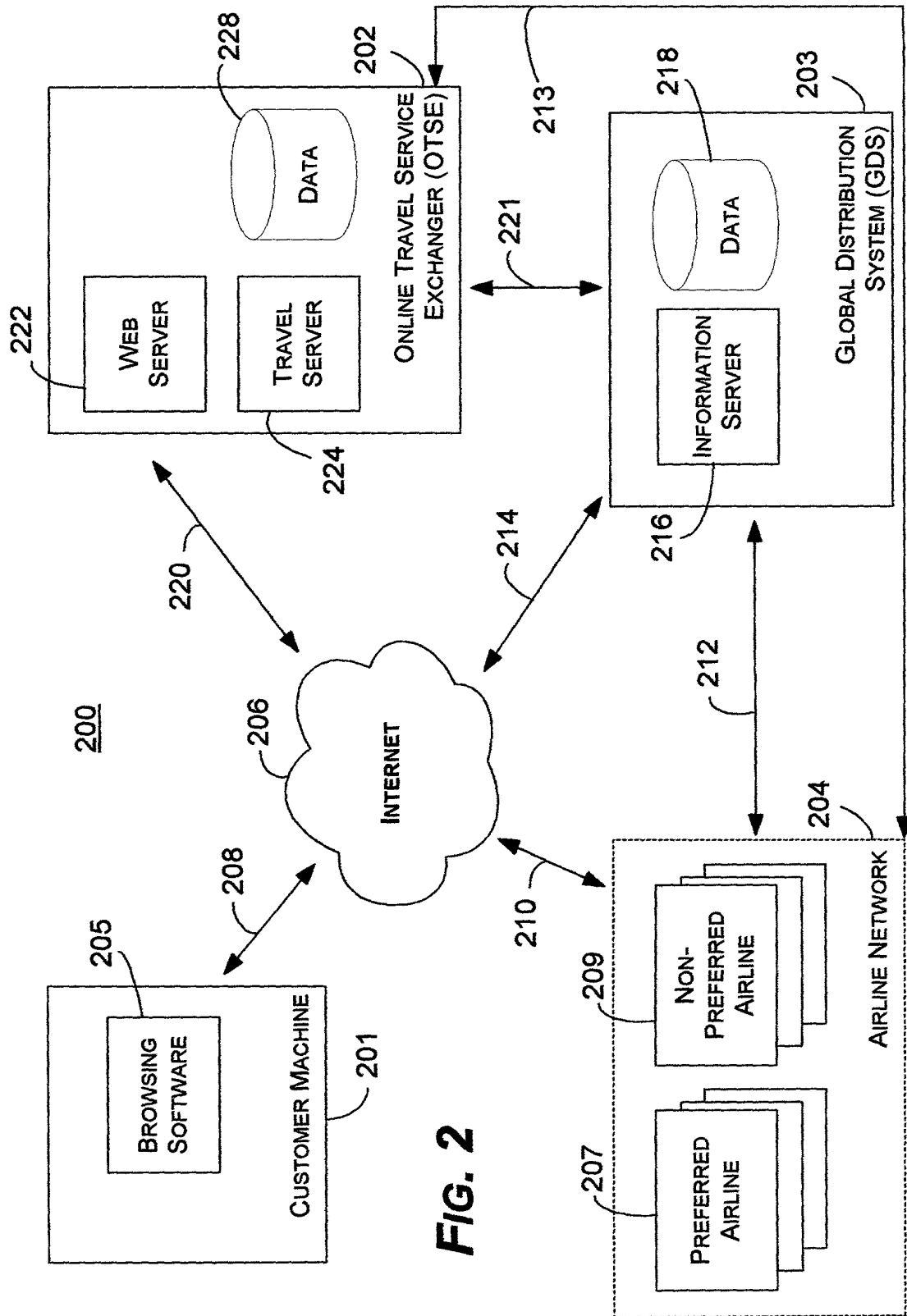


FIG. 1



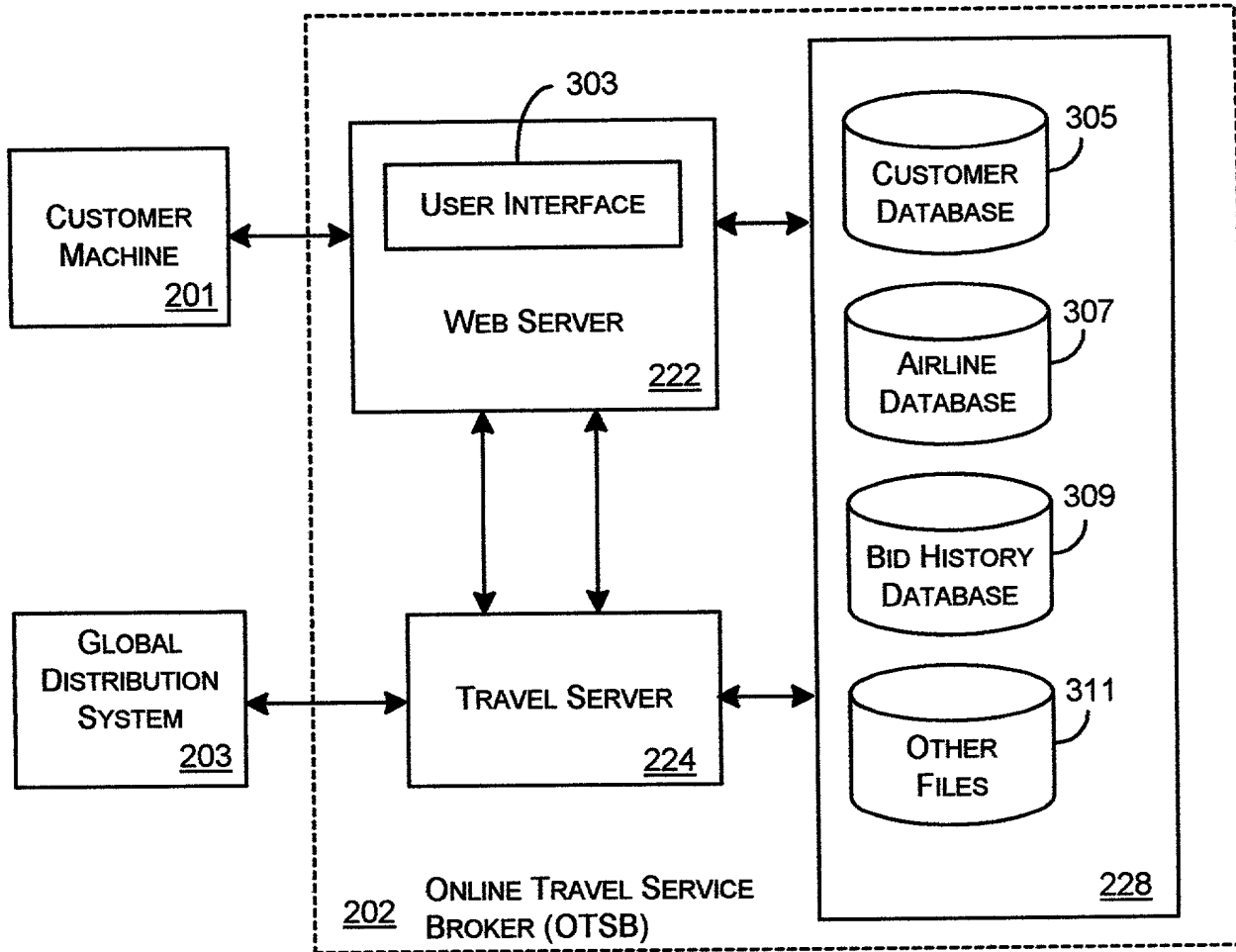


FIG. 3

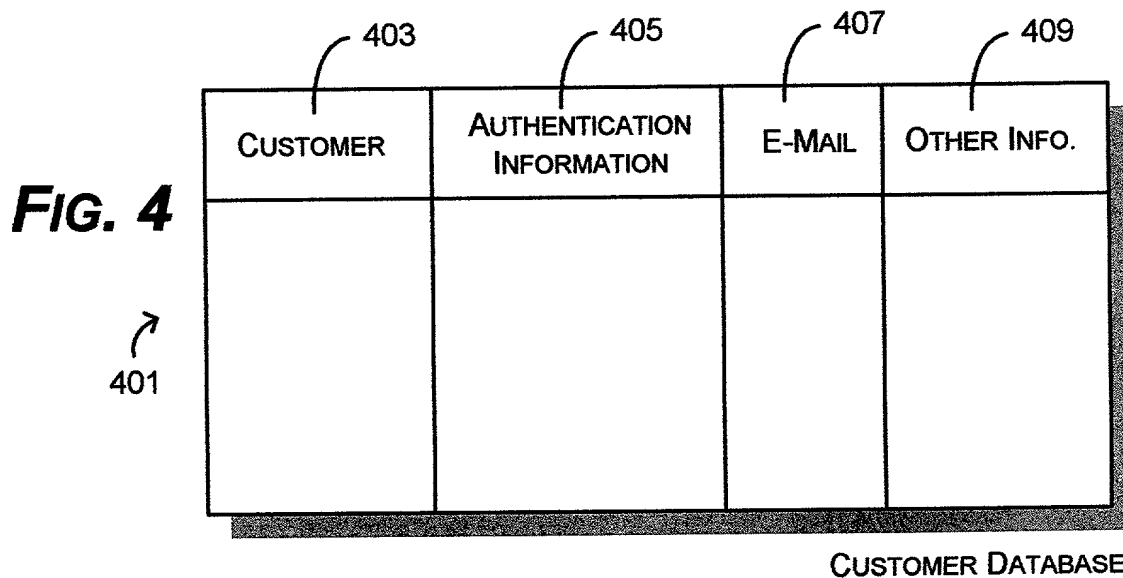


FIG. 5

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503 AIRLINE ID (CARRIER CODE)	505 PREFERRED (Y/N)	507 PREFERENCE	508 PREFERRED CRITERIA	509 OTHER INFO.

AIRLINE DATABASE

FIG. 6

601 ↗

603 BID ID	605 CUST. ID	607 TIME OF BID	609 OTHER BID INFO.

BID HISTORY DATABASE

701

OTSE USER INTERFACE

WHERE AND WHEN DO YOU WANT TO TRAVEL?

702 FROM:

703 To:

705 DEPARTING: (MM/DD/YY)

707 RETURNING: (MM/DD/YY)

☒ INCLUDE VERY EARLY AND VERY LATE FLIGHTS

709 WHO IS GOING ON THIS TRIP?

<input type="text" value="1"/>	ADULTS (AGE 12 TO 61)
<input type="text" value="0"/>	SENIORS (AGE 62 AND OVER)
<input type="text" value="0"/>	CHILDREN (AGE 2 TO 11)
<input type="text" value="0"/>	INFANTS (UNDER AGE 2)

711 HOW MANY CONNECTIONS ARE YOU WILLING TO MAKE?

NUMBER OF STOPS

713 TELL US YOUR PRICE

\$.00 PER TRAVELER

NEXT STEP

FIG. 7

801

OTSE USER INTERFACE

TRAVELER INFORMATION?

803 LAST NAME:

805 FIRST NAME:

807 HOME PHONE NUMBER: WORK PHONE NUMBER:

809 -- SPECIAL ASSISTANCE --

811 EMERGENCY CONTACT

NAME:

CONTACT PHONE NUMBER:

CREATE AN ACCOUNT

813 MEMBER ID:

815 PASSWORD:

☒ SAVE THIS PASSWORD

817 E-MAIL ADDRESS:

819 ☒ SEND ME INFORMATION

821 NEXT STEP

FIG. 8

901

OTSE USER INTERFACE

903 VERIFY YOUR REQUEST

\$375 PER TRAVELER
DEPARTURE CITY TO DESTINATION CITY
ON IDENTIFIED DATES OF TRAVEL

905 CREDIT CARD INFORMATION

-- SELECT CARD TYPE --

907 CARD NUMBER: EXPIRATION DATE 909

☒ REMEMBER THIS CARD FOR FUTURE USE

CARD HOLDER'S NAME:

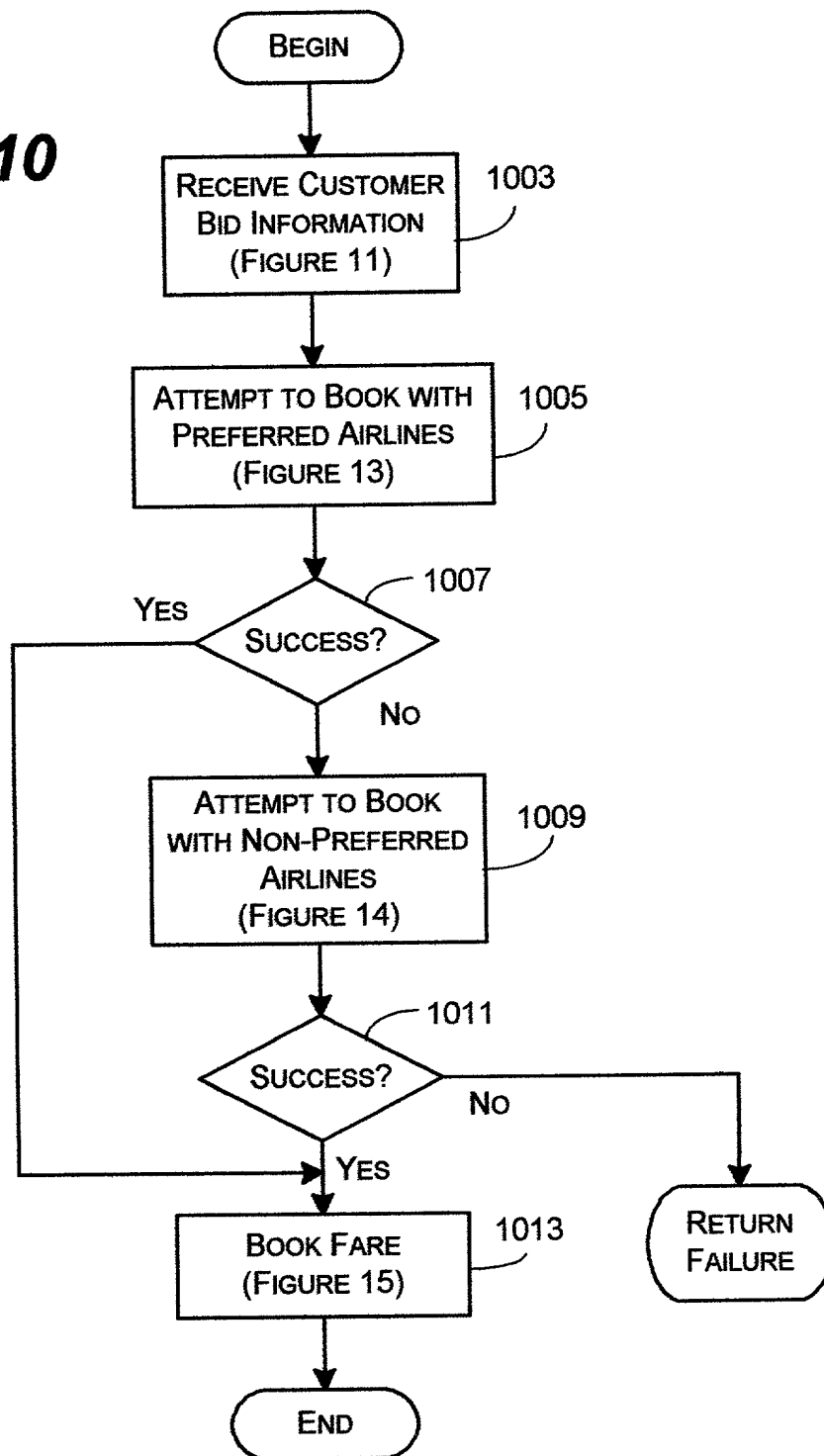
911 BILLING ADDRESS

913 DELIVERY ADDRESS

☒ USE THIS ADDRESS

915 → NEXT STEP

FIG. 9

FIG. 10

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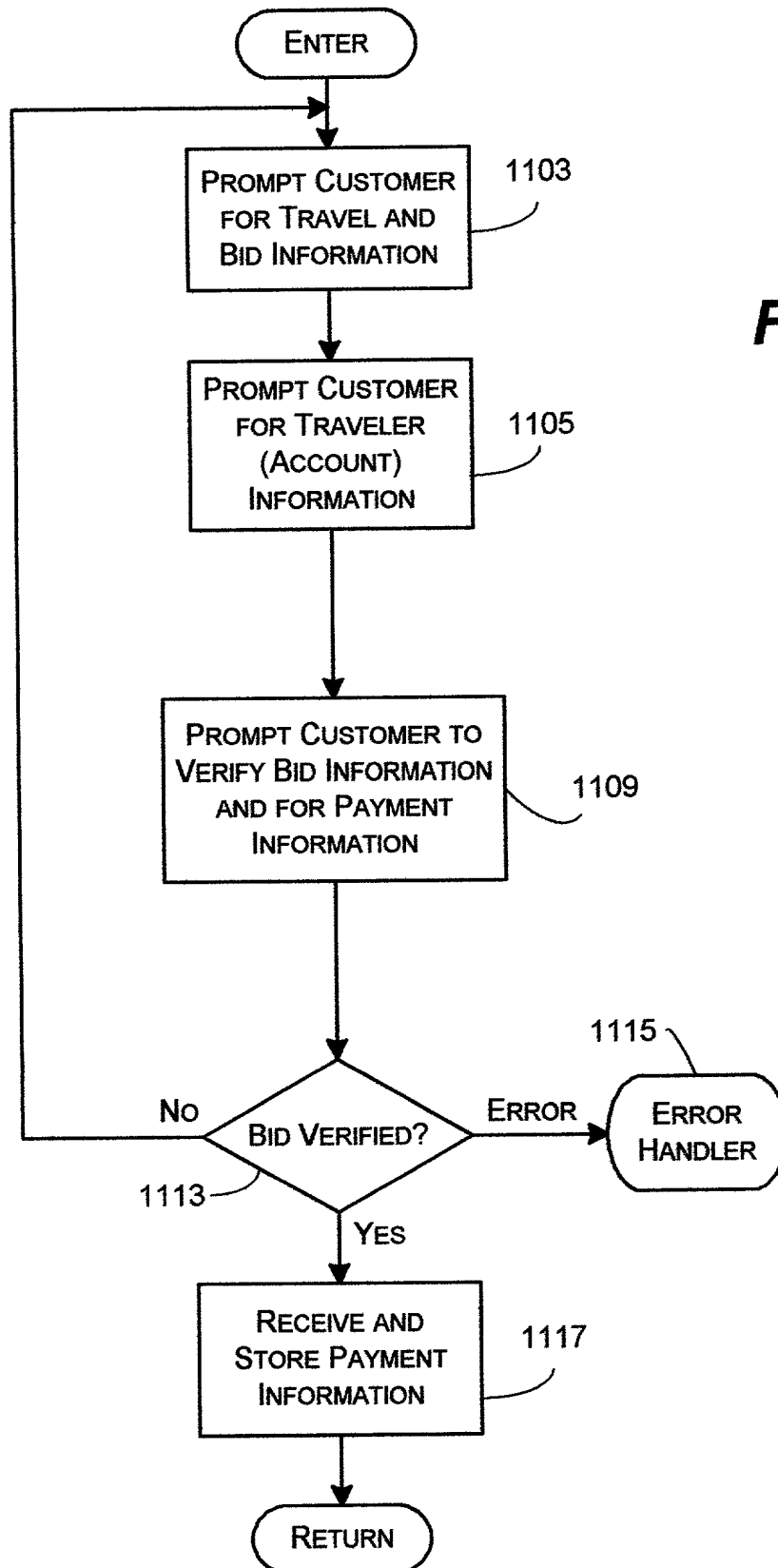


FIG. 11

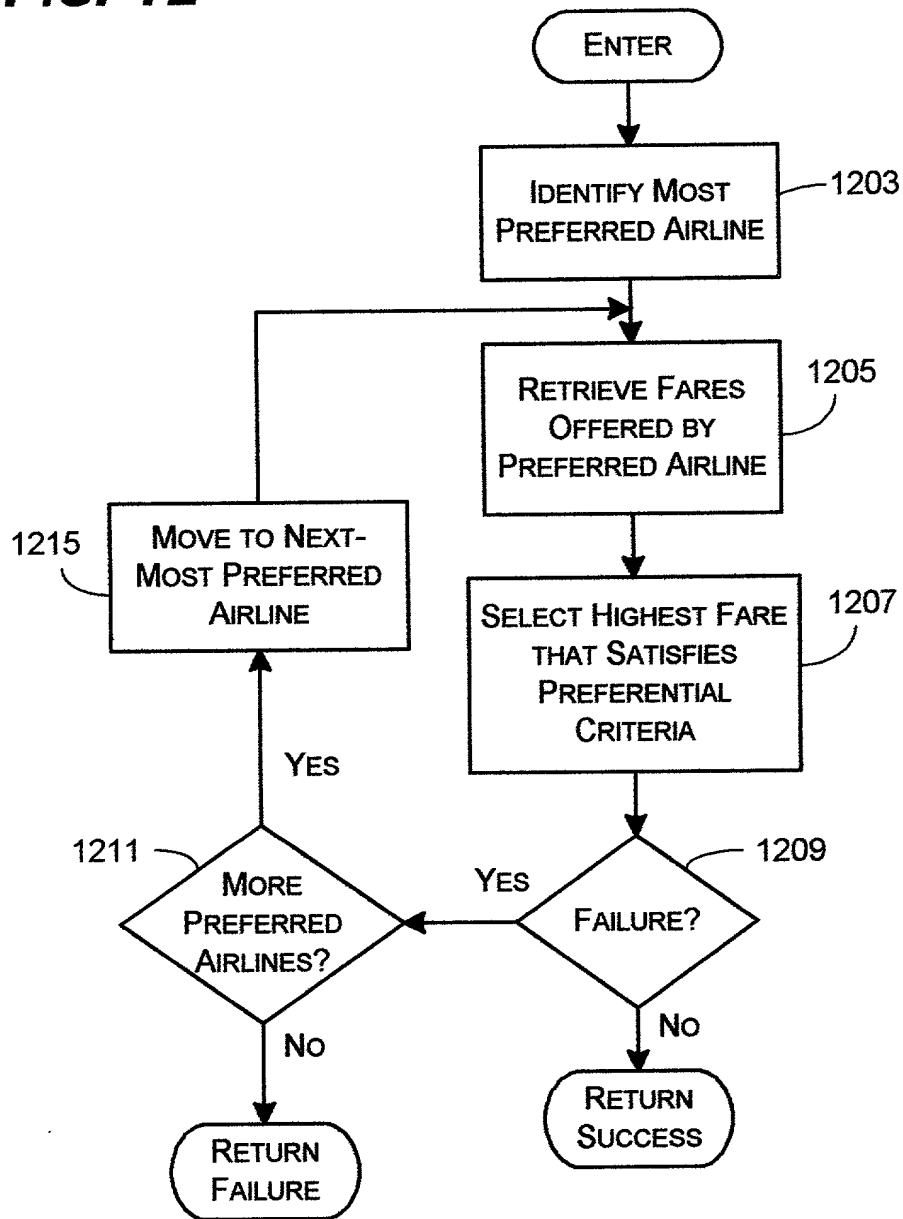
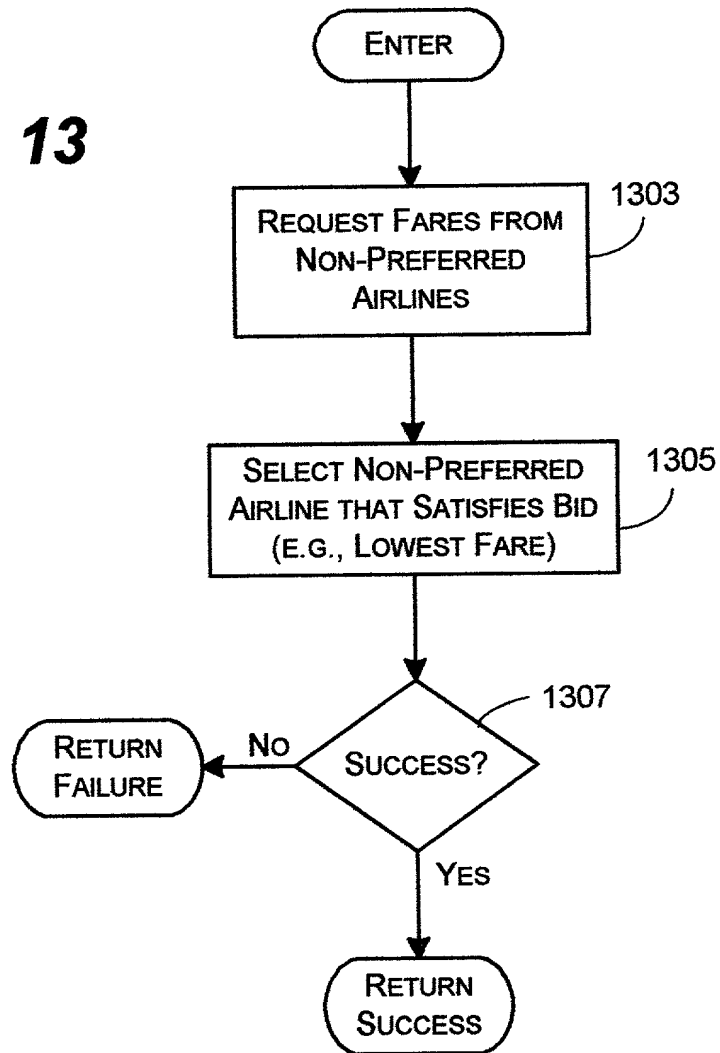
FIG. 12

FIG. 13

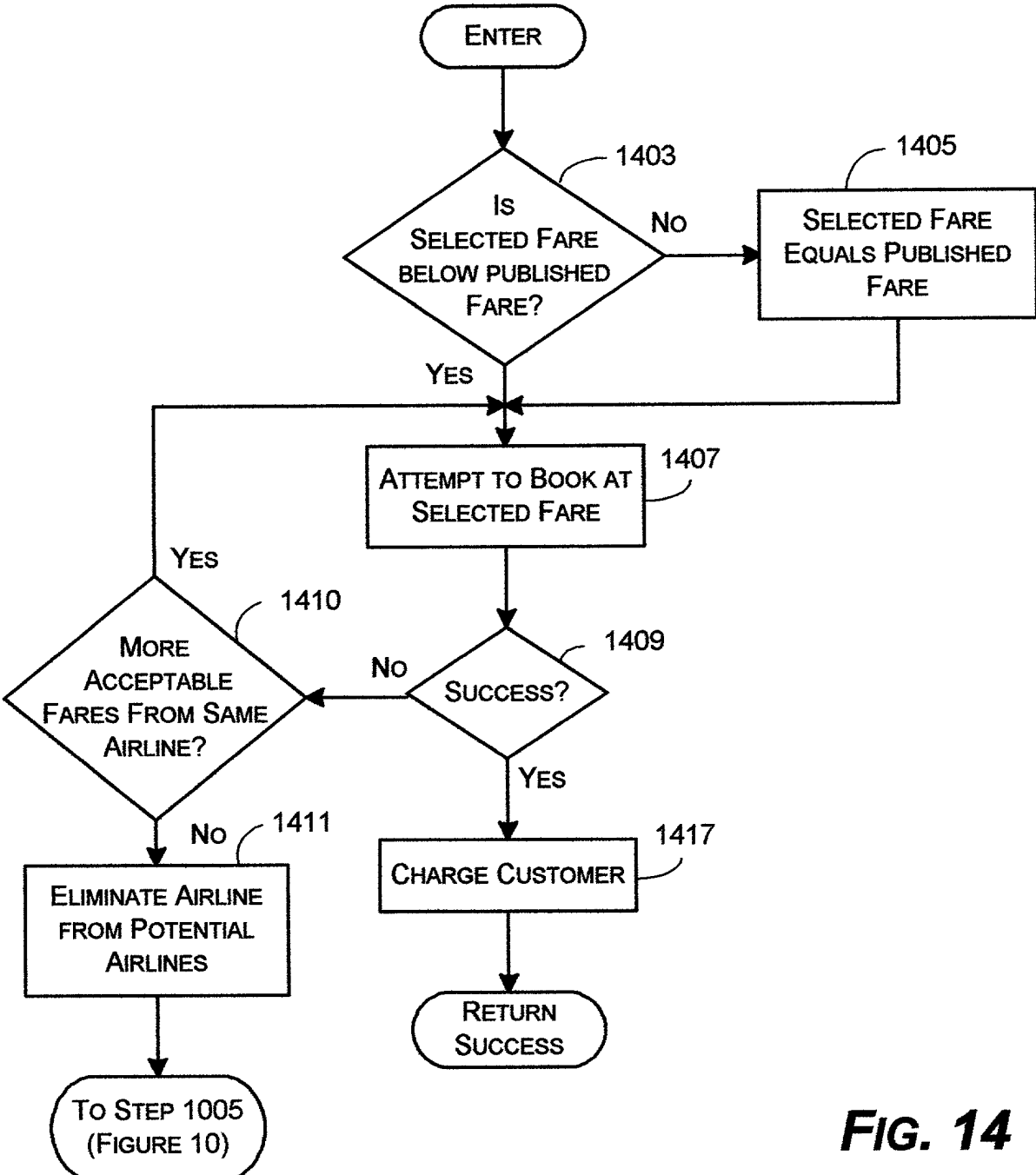


FIG. 14

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: "**System And Method For Matching An Offer With A Quote**," the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____, as United States Application Serial No. _____ or PCT International Application No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

Priority Not Claimed

(Number) (Country) (Day/Month/Year Filed)

☐

(Number) (Country) (Day/Month/Year Filed)

☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

(Application Number) (Filing Date)

(Application Number) (Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT international application(s) designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. § 1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application.

(Application Number) (Filing Date) (Status – patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status – patented, pending, abandoned)

[illegible]

As a named inventor, I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Albert S. Michalik, Reg. No. 37,395 Roger D. Wylie, Reg. No. 36,794
Daniel D. Crouse, Reg. No. 32,022 Katie E. Sako, Reg. No. 32,628

Address all telephone calls to Roger D. Wylie at telephone number (425) 653-3520.

Address all correspondence to: Michalik & Wylie, PLLC
14645 Bel-Red Road
Suite 103
Bellevue, WA 98007

I hereby declare that all statements made herein of my own knowledge are true, that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of **sole or first inventor**: Hugh H. Birch

Inventor's signature 

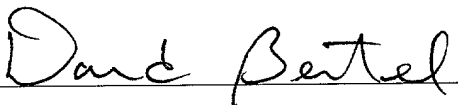
Date Aug 23, 2000

Country of Citizenship: USA

Residence: 15041 225th Ave NE, Woodinville, WA 98072

Post Office Address: Same

Full name of **second inventor**: David A. Beitel

Inventor's signature 

Date Aug 23, 2000

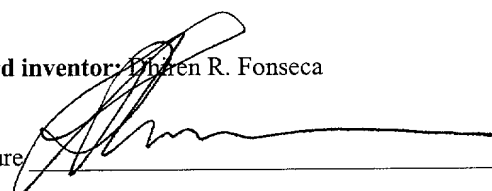
Country of Citizenship: USA

Residence: 2035 23rd Ave E, Seattle, WA 98112

Post Office Address: Same

☒ Additional inventors are being named on separately numbered sheets attached hereto.

Full name of **third inventor**: Darren R. Fonseca

Inventor's signature 

Date Aug 23, 2000

Country of Citizenship: USA

Residence: 1524 McGilvra Blvd. E, Seattle, WA 98112

Post Office Address: Same

☐ Additional inventors are being named on separately numbered sheets attached hereto.

2610 declaration